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IN REPLY REFER TO: Joint Interoperability Test Command (JTE)

MEMORANDUM FOR DISTRIBUTION **7 Mar 11**

SUBJECT: Extension of the Special Interoperability Test Certification of REDCOM Slice 2100 with Software Release 3.0A Revision 3, with Specified Patch Group 0 (3.0A R3P0)

References: (a) DoD Directive 4630.05, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01E, "Interoperability and Supportability of Information Technology and National Security Systems," 15 December 2008
(c) through (g), see Enclosure

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification.

2. The REDCOM Slice 2100 with Software Release 3.0A R3P0 is hereinafter referred to as the System Under Test (SUT). The SUT met all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Switched Network (DSN). The SUT is certified for Voice over Internet Protocol (VoIP) with certified Assured Services Local Area Networks (ASLANs) on the Unified Capabilities (UC) Approved Products List (APL). The listed test discrepancies shown in the SUT Interoperability Test Summary have an overall minor operational impact. The SUT was tested and met the critical interoperability requirements for a Deployable Voice Exchange (DVX), Private Branch Exchange (PBX) 1, and PBX 2. The SUT offers a virtual-tactical network element Proprietary Internet Protocol Trunk (PIPT). The PIPT trunk can only be deployed within a tactical DSN environment and is not certified for joint use within the strategic DSN. No other configurations, features, or functions, except those cited within this report, are certified by the JITC. This certification expires upon changes that could affect interoperability, but no later than three years from the date of the original memorandum (4 February 2009).

3. The extension of this certification is based upon Desktop Review (DTR) 1. The original certification is based on interoperability testing conducted by JITC, review of the vendor's Letters of Compliance (LoC), and Defense Information Assurance (IA)/Security Accreditation Working Group (DSAWG) accreditation. Testing was conducted at JITC's Global Information Grid Network Test Facility at Fort Huachuca, Arizona, from 26 November 2007 through 18 January 2008. Regression testing was conducted from 28 July through 5 September 2008 to test patches developed to fix test discrepancies discovered during initial testing and documented in Reference (c). Review of the vendor's LoC was completed on 14 October 2008. DSAWG

granted accreditation on 13 January 2009 based on the security testing completed by DISA-led Information Assurance test teams and published in a separate report, Reference (d). This DTR was requested to include shared access with the Cisco 7960 Internet Protocol (IP) phone. The Cisco 7960 IP phone will have to be configured for auto negotiation 100 Megabits per second (Mbps) Fast Ethernet (FE) in lieu of hard set 100 Mbps FE to meet the shared access requirements. The JITC determined there was minor risk in approving this DTR based on JITC analysis of the vendor's test results of shared access with the Cisco 7960 IP phone. Therefore, JITC approves this DTR. DISA Network Systems Directorate has approved the Information Assurance posture of SUT in this DTR on 4 February 2011.

4. The interoperability test summary of the SUT is contained in Table 1. The DVX required and conditional Capability Requirements (CRs) and Feature Requirements (FRs) are listed in Table 2. The differences between DVX and PBX 1 requirements are depicted in Table 3. This interoperability test status is based on the SUT's ability to meet:

a. DSN services for Network and Applications specified in Reference (e).

b. DVX interface and signaling requirements for trunks/lines specified in Reference (f) verified through JITC testing and/or vendor submission of LoC.

c. DVX CRs/FRs specified in Reference (f) verified through JITC testing and/or vendor submission of LoC.

d. The overall system interoperability performance derived from test procedures listed in Reference (g).

Table 1. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	**Critical**	**Status**	**Remarks**
T1 CAS (DTMF, DP)	Yes	Certified	Met all critical CRs and FRs.
T1 CAS (MFR1)	No	Certified	Met all critical CRs and FRs.
E1 CAS (DTMF, DP)	Yes (Europe only)	Certified	Met all critical CRs and FRs.
E1 CAS (MFR1)	No (Europe only)	Certified	Met all critical CRs and FRs.
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all critical CRs and FRs.
E1 PRI (ITU-T Q.955.3)	No (Europe only)	Certified	Met all critical CRs and FRs.
T1 SS7 (ANSI T1.619a)	No	Not Tested	T1 SS7 is not supported by the SUT. This is not a required interface for a DVX or PBX 1. There is no risk associated with the SUT not supporting this interface.
E1 SS7 (ANSI T1.619a)	No	Not Tested	E1 SS7 is not supported by the SUT. This is not a required interface for a DVX or PBX 1. There is no risk associated with the SUT not supporting this interface.
Analog E&M Type I, II, V	Yes	Certified	Met all critical CRs and FRs.
PIPT (Session Initiation Protocol) (IEEE 802.3u)	No	Certified	Met all critical CRs and FRs. See note 1.

Table 1. SUT Interoperability Test Summary (continued)

DSN Line Interfaces			
Interface & Signaling	**Critical**	**Status**	**Remarks**
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all critical CRs and FRs with the following minor exception: The conference disconnect tone does not meet the specifications.[2]
ISDN BRI NI 1/2	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: The precedence above ROUTINE ringing cadence that the SUT applies to BRI phones does not meet the specifications.[3] The conference disconnect tone does not meet the specifications.[2]
2-Wire Proprietary Digital	No	Not Tested	This interface is not supported by the SUT. This is not a required feature for a DVX or PBX 1. There is no risk associated with the SUT not supporting this interface.
VoIP (Session Initiation Protocol)	No	Certified	Met all critical CRs and FRs with the following minor exception: The conference disconnect tone does not meet the specifications.[2]
DSN Features and Capabilities			
Features and Capabilities	**Critical**	**Status**	**Remarks**
Common Features	Yes	Certified	Met all critical CRs and FRs with the following minor exception: The SUT does not correctly support the call forwarding variable "ping ring" feature.[4]
Attendant	No	Certified	Met all critical CRs and FRs.
Public Safety	Yes	Certified	Met all critical CRs and FRs with the following minor exception: The SUT does not support tandem call trace.[5]
Conferencing – Preset	Yes	Certified	Met all critical CRs and FRs.
Conferencing – Conference Notification Recorded Announcement	Yes	Certified	Met all critical CRs and FRs.
Conferencing – Automatic Retrial and Alternate Address	Yes	Certified	Met all critical CRs and FRs.
Conferencing – Bridge Release	Yes	Certified	Met all critical CRs and FRs.
Conferencing – Lost Connection	Yes	Certified	Met all critical CRs and FRs.
Conferencing – Secondary Conferencing	Yes	Certified	Met all critical CRs and FRs.
Conferencing – Meet-me	No	Certified	Met all critical CRs and FRs.
Conferencing – Progressive	No	Certified	Met all critical CRs and FRs.
Nailed-up Connections	No	Not Tested	This feature is not supported by the SUT. This is not a required feature for a DVX or PBX 1. There is no risk associated with the SUT not supporting this feature.
DSN Hotline Services	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT will not allow the protection of a hotline call originator through the use of a hotline list as required by the UCR. The operational impact is minor.[6] The SUT does not support interswitch protected hotline calling.[7]
MLPP	Yes	Certified	Met all critical CRs and FRs with the following minor exception: The SUT does not support the loss of Command and Control announcement.[8]
Call Processing	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT does not support the full complement of CoS tables.[9] The SUT does not support calling number delivery.[8]
Network Management	Yes	Certified	Met all critical CRs and FRs with both serial EIA-232 and Internet Protocol (IP) interfaces.
ISDN Services	Yes	Certified	Met all critical CRs and FRs.
Synchronization	Yes	Certified	Met all critical CRs and FRs.
Reliability	Yes	Certified	Met all critical CRs and FRs.[10]
Security	Yes	Certified	See note 11.
VoIP System	No	Certified	The SUT is certified for VoIP with any certified ASLAN posted on the UC APL. See note 12.

Table 1. SUT Interoperability Test Summary (continued)

Network Gateways				
Gateway	**Interface & Signaling**	**Critical**	**Status**	**Remarks**
PSTN	T1 CAS (DTMF, DP, MFR1)	Yes	Certified	Met all critical CRs and FRs.
	E1 CAS (DTMF, DP, MFR1)	Yes (Europe only)	Certified	Met all critical CRs and FRs.
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	Yes	Certified	Met all critical CRs and FRs.
	E1 PRI (ITU-T Q.931)	No (Europe only)	Certified	Met all critical CRs and FRs.
	Ground Start Line	Yes	Certified	Met all critical CRs and FRs.

NOTES:

1 The PIPT trunk can only be deployed within a tactical DSN environment and is not certified for joint use within the strategic DSN.

2 The conference disconnect tone that is provided by the SUT does not meet the specifications designated in UCR, section 5.5.2. The SUT conference disconnect tone is distinguishable from other DSN tones and cadences; therefore, this anomaly has a minor operational impact.

3 The precedence above ROUTINE ringing cadence that the SUT applies to BRI phones does not meet the specifications as detailed in the UCR, section 5.5.1. The precedence above ROUTINE cadence is distinct from the ROUTINE cadence when it is configured properly; therefore this anomaly has no operational impact.

4 When CFV is assigned to any station on the SUT and CFV is invoked by the user, any station with CFV invoked does not receive a "ping" ring when calls are being forwarded. The operational impact is minor.

5 The SUT cannot perform a tandem call trace of a specified distant office directory number as specified in the UCR. This anomaly was adjudicated by DISA, and determined to have a minor operational impact.

6 The SUT will not allow the protection of a hotline call originator through the use of a hotline list as required by the UCR. However, this capability can be accomplished with the SUT by classmarking authorized hotline users for receiving only calls from other hotline callers. The operational impact is minor.

7 This requirement was modified in the UCR 2007 to add clarification regarding interswtich hotline protection. Prior to the UCR 2007, only intraswitch hotline protection was required and tested. The SUT meets the intraswitch hotline protection requirement. The SUT does not support interswitch hotline protection in accordance with the UCR 2007; however, the vendor has 18 months (till June 2009) to develop this new requirement. The operational impact is minor.

8 This is a new UCR requirement and the vendor has 18 months (until July 2009) to develop this capability.

9 The SUT does not support the full complement of CoS tables as specified in the UCR. The SUT supports 255 CoS tables for analog lines and does not support CoS tables on access lines, number codes, trunks, or groups of trunks. This limitation has posed a minor operational impact within the DSN when assigning lines and trunks on the SUT.

10 Backup power, power components, UPS requirements, UPS load capacity and alarms are non-testable requirements. It is the responsibility of the respective base/post/camp/station communication agency to provide this with the SUT when installed.

11 Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (d).

12 An IPv6 capable system or product, as defined in the UCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in manner similar to that of IPv4. IPv6 capability is currently satisfied by a vendor Letter of Compliance signed by the Vice President of their respective company. The vendor stated in writing, their intent to return to JITC for testing of their solution with IPv6 enabled earliest date available. In addition they stated in writing, compliance to the following criteria:

a. Conformant with IPv6 standards profile contained in the Department of Defense Information Technology Standards Registry (DISR). These standards are delineated in the UCR, appendix 11.

b. Maintaining interoperability in heterogeneous environments and with IPv4.

c. Commitment to upgrade as the IPv6 standard evolves.

d. Availability of contractor/vendor IPv6 technical support.

Table 1. SUT Interoperability Test Summary (continued)

LEGEND:

802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	FRs	Feature Requirements	NI 1/2	National ISDN Standard 1 or 2
		GR	Generic Requirement	PIPT	Proprietary Internet Protocol Trunk
ANSI	American National Standards Institute	GR-506-CORE	LSSGR: Signaling for Analog Interfaces	PRI	Primary Rate Interface
APL	Approved Products List	IEEE	Institute of Electrical and Electronics Engineers	PMO	Program Management Office
ASLAN	Assured Services Local Area Network			PSTN	Public Switched Telephone Network
BRI	Basic Rate Interface	IPv4	Internet Protocol version 4		
CAS	Channel Associated Signaling	IPv6	Internet Protocol version 6	Q.931	Signaling Standard for ISDN
CFV	Call Forwarding Variable	ISDN	Integrated Services Digital Network	Q.955.3	ISDN signaling standard for E1 MLPP
CoS	Class of Service				
CRs	Capability Requirements	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	SMEO	Small End Office
DISA	Defense Information Systems Agency			SS7	Signaling System 7
DP	Dial Pulse			SUT	System Under Test
DSN	Defense Switched Network			T1	Digital Transmission Link Level 1 (1.544 Mbps)
DSS1	Digital Subscriber Signaling 1				
DTMF	Dual Tone Multi-Frequency	JITC	Joint Interoperability Test Command	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
DVX	Deployable Voice Exchange				
E&M	Ear and Mouth	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements		
E1	European Basic Multiplex Rate (2.048 Mbps)			T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
EIA	Electronic Industries Alliance				
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices	Mbps	Megabits per second	UC	Unified Capabilities
		MFR1	Multi-Frequency Recommendation 1	UCR	Unified Capabilities Requirements
		MLPP	Multi-Level Precedence and Preemption	UPS	Uninterruptible Power Supply
				VoIP	Voice over Internet Protocol

Table 2. DVX Requirements

DSN Trunk Interfaces				
Interface	**Critical**	**Requirements Required or Conditional**		**References**
T1 SS7 (ANSI T1.619a) E1 SS7 (ITU-T Q.735.3) T1 CAS (MFR1, DTMF, DP) E1 CAS (MFR1, DTMF, DP) T1 ISDN PRI NI 1/2 (ANSI T1.619a) E1 ISDN PRI (ITU-T Q.955.3) Analog E&M Type I, II, V	No No (Europe only) Yes Yes (Europe only) Yes No (Europe Only) Yes	Trunking	• Direct Inward Dialing (C) • National ISDN 1/2 Primary Access (R) • ISDN ANSI MLPP Service Capability (R) • ITU-T ISDN Primary Access (Europe only) (C) • ITU-T ISDN Primary Access Digital Subscriber Signaling System Number 1 MLPP (Europe only) (C) • Normal Wink Start Operations (R) • Glare Operation (R) • Abnormal Wink Start (R) • Glare Resolution (R) • Call for Service Timing (R) • Guard Timing (R) • Satellite Timing (R) • Disconnect Control (R) • Reselect and Retrial (R) • Off-Hook Supervision Transition (R) • Dial-Pulse Signals (R) • DTMF Signaling (R) • Standard Digit Format for Precedence (C) • MFR1 2/6 Signaling (R) • Alerting Signals and Tones (R) • Common Channel Signaling 7 (C) • DSN ISDN User-to-Network Signaling (R) • Application (R) • Physical Layer (R) • Data Link Layer (R) • Data Link Connection (R) • Peer-to-Peer Procedures of Data-Link Layer (R) • Layer 3 DSN User-to-Network Signaling (R) • DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R) • Sequence of Messages for DSN Circuit-Switched Calls (R) • Message Functional Definition and Content (R) • General Message Format and Information Elements Coding (R) • Supplementary Services (C) • PCM-24 Digital Trunk Interface (R) • PCM-30 Digital Trunk Interface (Europe only) (R) • Interoperation of PCM-24 and PCM-30 (C) • Analog Trunk Interface (C) • Integrated Digital Loop Carrier (C) • Local Office Test Line (C) • Outside Plant Test Lines (C) • Test Incoming Trunks Tandem or Local State (C) • Manual Test of Trunks (R) • Trunk Group-Remove from Service (R) • Trunk Group-Restore to Service (R) • Carrier Group Alarm (R) • Software Carrier Group Alarm (C)	• UCR Section 2.3.2 • UCR Section 2.3.4.1 • UCR Section 2.3.4.1.1 • UCR Section 2.3.4.2 • UCR Section 2.3.4.2.1 • UCR Section 5.3.3.1.1 • UCR Section 5.3.3.1.2 • UCR Section 5.3.3.2.1 • UCR Section 5.3.3.2.2 • UCR Section 5.3.5 • UCR Section 5.3.6 • UCR Section 5.3.7 • UCR Section 5.3.8 • UCR Section 5.3.9 • UCR Section 5.3.10 • UCR Section 5.4.1 • UCR Section 5.4.2 • UCR Section 5.4.2.1 • UCR Section 5.4.3 • UCR Section 5.5 • UCR Section 5.6 • UCR Section 5.7.1 • UCR Section 5.7.1.1 • UCR Section 5.7.1.2 • UCR Section 5.7.1.3 • UCR Section 5.7.1.3.1 • UCR Section 5.7.1.3.2 • UCR Section 5.7.1.4 • UCR Section 5.7.1.4.2 • UCR Section 5.7.1.4.3 • UCR Section 5.7.1.4.4 • UCR Section 5.7.1.4.5 • UCR Section 5.7.1.4.6 • UCR Section 7.1 • UCR Section 7.2 • UCR Section 7.3 • UCR Section 7.4 • UCR Section 7.5 • UCR Section 2.5.1 • UCR Section 2.5.2 • UCR Section 2.5.3 • UCR Section 2.5.4.2 • UCR Section 2.5.5 • UCR Section 2.5.6 • UCR Section 2.5.7 • UCR Section 2.5.7.1

Table 2. DVX Requirements (continued)

DSN Trunk Interfaces				
Interface	**Critical**	**Requirements Required or Conditional**		**References**
T1 SS7 (ANSI T1.619a)	No	Voice	• MOS (R) • Secure calls (R)	• CJCSI 6215.01C • CJCSI 6215.01C
E1 SS7 (ITU-T Q.735.3)	No (Europe only)	Facsimile	• Analog: ITU-T T.4 (R)	• DISR
T1 CAS (MFR1, DTMF, DP)	Yes	Data	• Modem (VBD) (R) • 56 kbps switched data (R: PRI only) • 64 kbps switched data (R: PRI only) • NX56 synchronous BER (R: PRI only) • NX64 synchronous BER (R: PRI only) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01C • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • CJCSI 6215.01C
E1 CAS (MFR1, DTMF, DP)	Yes (Europe only)			
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	VTC	• ITU-T H.320 (R: PRI only)	• FTR 1080B-2002
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe Only)			
Analog E&M Type I, II, V	Yes			
PIPT (Session Initiation Protocol) IEEE 802.3u	No	Trunking	• Tactical Network Element TDM Requirements (C) • Tactical Network Element IP Requirements (C) • Encapsulated TDM Requirements (C) • Proprietary IP Trunk Requirements (C)	• UCR App. 2, para. A2.4.2 • UCR App. 2, para. A2.4.3 • UCR App. 2, para. A2.4.4 • UCR App. 2, para. A2.4.6
DSN Line Interfaces				
2-Wire Analog	Yes	Access	• Directory Number Identification (R) • PBX Line (C) • National ISDN 1/2 Basic Access (C) • Analog Line (R) • Basic Line Test Capabilities (C) • Advanced Line Test Capabilities (C) • Network Power Systems for External Interfaces (C) • Loop Start Line (R: 2-Wire Analog only) • Reverse Battery (R) • Alerting Signals and Tones (R) • S/T Reference Point (ISDN BRI) (C)	• UCR Section 2.1.1 • UCR Section 2.3.1 • UCR Section 2.3.3 • UCR Section 2.3.5 • UCR Section 2.5.4.1.1 • UCR Section 2.5.4.1.2 • UCR Section 5.1 • UCR Section 5.2.1 • UCR Section 5.3.1 • UCR Section 5.5 • UCR Section 5.7.1.2.1
ISDN BRI NI 1/2 (ANSI T1.619a)	Yes			
2W Digital Proprietary	No	Voice	• MOS (R) • Secure Calls (R)	• CJCSI 6215.01C • CJCSI 6215.01C
VoIP	No	Facsimile	• Analog: ITU-T T.4 (R)	• DISR
		Data	• Modem (VBD) (R) • 56 kbps switched data (R) • 64 kbps switched data (R: BRI only) • NX56 synchronous BER (R: BRI only) • NX64 synchronous BER (R: BRI only) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01C • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • CJCSI 6215.01C
		VTC	• ITU-T H.320 (R: BRI only)	• FTR 1080B-2002

Table 2. DVX Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
Common Features	Yes	• Individual Lines (R) • Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (R) • Call waiting (R) • Three-way calling (R) • Add-on transfer, conference calling, and call hold (C) • Call Transfer Individual – All calls (R) • Call Transfer - Internal Only (R) • Call Transfer – Individual – Incoming Only/Add-On Consultation Hold – Incoming Call (R) • Call Transfer – Outside (R) • Call Transfer – Add-On Restricted Station (C) • Call Transfer – Attendant (C) • Call Hold (R) • Conference Calling – Six Way Station Controlled (C) • Call Forwarding Variable (R) • Call Forward Busy Line (R) • Call Forwarding – Don't Answer – All Calls (R) • Selective Call Forwarding (C) • Call pick-up (C) • Address Translation (C) • Assured Dial Tone (R)	• UCR Section 2.1 • UCR Section 2.1.2 • UCR Section 2.1.3 • UCR Section 2.1.4 • UCR Section 2.1.5 • UCR Section 2.1.6 • UCR Section 2.1.7 • UCR Section 2.1.7.1 • UCR Section 2.1.7.2 • UCR Section 2.1.7.3 • UCR Section 2.1.7.4 • UCR Section 2.1.7.5 • UCR Section 2.1.7.6 • UCR Section 2.1.7.7 • UCR Section 2.1.7.8 • UCR Section 2.1.8.1 • UCR Section 2.1.8.2 • UCR Section 2.1.8.3 • UCR Section 2.1.8.4 • UCR Section 2.1.9 • UCR Section 2.7 • UCR Section 2.9
Attendant	No	• Attendant Features (C)	• UCR Section 2.2
Public Safety	Yes	• Basic Emergency Service (911) Caller (C) • Emergency Service (911) Public Safety Answering Point (C) • Enhanced Emergency Service (E911) (C) • Trace of terminating calls (R) • Outgoing call trace (R) • Tandem call trace (R) • Trace of a call in progress (R)	• UCR Section 2.4.1.1 • UCR Section 2.4.1.2 • UCR Section 2.4.1.3 • UCR Section 2.4.2 • UCR Section 2.4.3 • UCR Section 2.4.4 • UCR Section 2.4.5
Conferencing	Yes	• Preset Conferencing (R) • Conference Notification Recorded Announcement (R) • Automatic Retrial and Alternate Address (R) • Bridge Release (R) • Lost Connection to Conferee or Originator (R) • Secondary Conferencing (R) • Meet-Me Conferencing (C) • Progressive Conferencing (C)	• UCR Section A2.3.3 • UCR Section A2.3.3 • UCR Section A2.3.3 • UCR Section A2.3.3 • UCR Section A2.3.3 • UCR Section A2.3.3 • UCR Section 2.6.2 • UCR Section 2.6.3
Nailed-up Connections	No	• Nailed-Up Connection (C)	• UCR Section 2.8
DSN Hotline Services	Yes	• DSN Analog Hotline Service (R) • DSN ISDN Hotline Service (R) • Classmarking (R) • Protected Hotline Calling (R) • Hotline Service Protection (R) • Non-Pair Protected Hotline Calling (R) • Pair Protected Hotline Calling (R)	• UCR Section 2.12 • UCR Section 2.12 • UCR Section 2.12 • UCR Section 2.12.1 • UCR Section 2.12.2 • UCR Section 2.12.3 • UCR Section 2.12.4

Table 2. DVX Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
MLPP	Yes	• MLPP Overview (R) • Precedence Levels (R) • Announcements (R) • Attendant Queue Announcement (C) • Loss of C2 Announcement (C) • Invocation and Operation (R) • Preemption in the Network (R) • Network Facility with Lower Precedence Calls (R) • Cancel to / Cancel from (C) • Network Facility with Equal or Higher Precedence Calls (R) • MLPP Trunk Selection (R) • Hunt Sequence for Trunks (R) • ROUTINE Precedence Calls (R) • Precedence Calls Above ROUTINE Precedence (R) • Method 1 (R) • Method 2 (C) • MLPP Interworking with Other Networks (R) • Precedence Call Diversion (R) • Channel Associated Signaling (R) • Primary Rate Interface (R) • Common Channel Signaling Number 7 (C) • Analog Line MLPP (R) • ISDN MLPP Basic Rate Interface General Description (C) • Single B Channel, Single Appearance, Single DN (C) • Line Active with a Lower Precedence Call (C) • Line Active with a Equal or Higher Precedence Call (C) • Single B Channel, Multiple Appearances, Single DN (C) • Two B Channels, Multiple Appearances, Single DN (C) • Two B Channel, Two DN (Data Mode Only) (C) • ISDN Primary Rate Interface (R) • Precedence Call Waiting (C) • Call Forwarding (C) • Call Transfer (C) • Call Hold (C) • Three-Way Calling (C) • Call Pickup (C) • Conferencing (C) • Multiline Hunt Group (C) • Community of Interest (C) • MLPP Common Channel Signaling Number 7 (C) • CAS to CCS Trunk Network in a Mixed Media Network (C) • MLPP Interaction with EKTS features (C) • Network Management Manual Controls (C) • Data Collection (R)	• UCR Section 3.1 • UCR Section 3.1.2 • UCR Section 3.1.3 • UCR Section 3.1.3 • UCR Section 3.1.3 • UCR Section 3.1.4 • UCR Section 3.2 • UCR Section 3.2.1 • UCR Section 3.2.1.1 • UCR Section 3.2.2 • UCR Section 3.2.3 • UCR Section 3.2.3.1 • UCR Section 3.2.3.1.1 • UCR Section 3.2.3.1.2 • UCR Section 3.2.3.1.2.1 • UCR Section 3.2.3.1.2.2 • UCR Section 3.2.4 • UCR Section 3.3 • UCR Section 3.4.1 • UCR Section 3.4.2 • UCR Section 3.4.3 • UCR Section 3.5 • UCR Section 3.6.1 • UCR Section 3.6.2 • UCR Section 3.6.2.1 • UCR Section 3.6.2.2 • UCR Section 3.6.3 • UCR Section 3.6.4 • UCR Section 3.6.5 • UCR Section 3.7 • UCR Section 3.8.1 • UCR Section 3.8.2 • UCR Section 3.8.3 • UCR Section 3.8.4 • UCR Section 3.8.5 • UCR Section 3.8.6 • UCR Section 3.8.7 • UCR Section 3.8.8 • UCR Section 3.8.9 • UCR Section 3.9 • UCR Section 3.10 • UCR Section 3.11 • UCR Section 3.13 • UCR Section 3.14

Table 2. DVX Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
Call Processing	Yes	• Call Treatments (R) • Primary and Alternate Routing (R) • E&M Lead Signaling States (C) • 4-Wire Analog User Access Lines (C) • 2-Wire User Access Lines (R) • Termination of Analog Lines (R) • DSN Interswitch Trunk Call Processing (non-CCS/ISDN) (R) • DSN User Dialing (R) • Interswitch and Intraswitch Dialing (R) • Seven-Digit Dialing (R) • Ten-Digit Dialing (R) • Access Code (R) • Access Digit (R) • Precedence Digit (R) • Service Digit (R) • Route Code (R) • Area Code (R) • Switch Code (R) • Line Number (R) • Calling Name Delivery (C) • Calling Number Delivery (R) • Emergency Service 911 Conflict Resolution (C) • DSN Switch Outpulsing Digit Formats (R) • Standard Directory Number (R) • Standard Test Numbers (C) • Base Services – Abbreviated Numbers (R) • Digit Reception Requirements (R) • Digit Registration Capacity (R) • Screening (R) • Additional Dialing format for Coalition Forces (R)	• UCR Section 4.1 • UCR Section 4.2 • UCR Section 4.3.1 • UCR Section 4.3.2 • UCR Section 4.3.3 • UCR Section 4.3.4 • UCR Section 4.4 • UCR Section A2.3.4 • UCR Section 4.5.1.2 • UCR Section 4.5.1.2.1 • UCR Section 4.5.1.2.2 • UCR Section 4.5.1.3 • UCR Section 4.5.1.3.1 • UCR Section 4.5.1.3.2 • UCR Section 4.5.1.3.3 • UCR Section 4.5.1.4 • UCR Section 4.5.1.5 • UCR Section 4.5.1.6 • UCR Section 4.5.1.7 • UCR Section 4.5.1.8.1 • UCR Section 4.5.1.8.2 • UCR Section 4.5.1.9 • UCR Section 4.5.2 • UCR Section 4.5.3 • UCR Section 4.5.4 • UCR Section 4.5.5 • UCR Section 4.5.6 • UCR Section 4.5.7 • UCR Section 4.5.8 • UCR App. 2, para A2.3.4
Network Management	Yes	• Interfaces (R) • Data Quality (R) • Traffic Measurements (R) • Reference Data (C) • Line Servicing (C) • Trunk Groups (C) • Call Processors (C) • Switch Services (C) • Special Studies (C) • Remote Switching Studies (C) • Features (C) • Common Channel Signaling Network Measurements (C) • ISDN Measurements (C) • Traffic Capacity (R) • Fault management (R) • Configuration management (R) • Call Detail Recording Data Retention (C) • Network Management controls (C) • Remote access (R)	• UCR Section A2.3.6 • UCR Section 9.2.1 • UCR Section 9.2.2.1.1 • UCR Section 9.2.2.1.2 • UCR Section 9.2.2.2 • UCR Section 9.2.2.3 • UCR Section 9.2.2.4 • UCR Section 9.2.2.5 • UCR Section 9.2.2.6 • UCR Section 9.2.2.7 • UCR Section 9.2.2.8 • UCR Section 9.2.3 • UCR Section 9.2.4 • UCR Section 9.2.5 • UCR Section 9.3 • UCR Section 9.4 • UCR Section 9.5.2 • UCR Section 9.7 • UCR Section 9.8

Table 2. DVX Requirements (continued)

DSN Features & Capabilities (continued)			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
ISDN Services	Yes	• ISDN BRI signaling (C) • BRI Access, Call Control and Signaling (C) • Uniform Interface Configuration for BRIs (C) • Electronic Key Telephone Systems (EKTS) (C) • PRI Access, Call Control and Signaling (R) • PRI Features (C) • Packet Data Features and Capabilities (C)	• UCR App. 2, para. A2.3.4 • UCR Section 10, Table 10-1 • UCR Section 10, Table 10-2 • UCR Section 10, Table 10-3 • UCR Section 10, Table 10-4 • UCR Section 10, Table 10-5 • UCR Section 10, Table 10-6
Synchronization	Yes	• External Timing Mode (C) • Line timing mode (R) • General (C) • Internal Stratum 4 (R) • Synchronization Performance Monitoring Criteria (C) • DS1 Traffic Interfaces (C) • DS0 Traffic Interconnects (C)	• UCR Section 11.1.1.1 • UCR Section A2.3.9 • UCR Section 11.1.2.1 • UCR Section 11.1.2.2 • UCR Section 11.2 • UCR Section 11.3 • UCR Section 11.4
Reliability (See note 1.)	No	• Reliability Requirements (C)	• UCR Section 12.1
Security	No	• GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R)	• UCR Section 13
VoIP			
VoIP System	No	VoIP function is conditional. If VoIP is provided, **all** of the following requirements must be met: • Voice Quality with MOS of 4.0 or better (R) • ITU-T G.711 PCM CODEC (R) • MLPP (R) • Security (R) • Network management (R) • System timing (R) • Latency ≤ 60 milliseconds (R) • IPv6 capable (R) • Service Class Tagging (R) • VoIP System Downtime (IP network 35 min/yr Subscriber 12 min/yr) (C)	 • UCR App. 3, para. A3.2.1 • UCR App. 3, para. A3.2.2 • UCR App. 3, para. A3.2.3 • UCR App. 3, para. A3.2.4 • UCR App. 3, para. A3.2.5 • UCR App. 3, para. A3.2.6 • UCR App. 3, para. A3.2.7 • UCR App. 3, para. A3.2.8 • UCR App. 3, para. A3.2.9 • UCR App. 3, para. A3.2.10
Network Gateways			
Interface	**Critical**	**Requirements Required or Conditional**	**References**
PSTN (See note 2.)	Yes	Trunking • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) • Ground Start Line (R) • Immediate Start (C)	• CJCSI 6215.01C • CJCSI 6215.01C • CJCSI 6215.01C • UCR Section 5.2.2 • UCR Section 5.3.2

NOTES:
1 Backup power, power components, UPS requirements, UPS load capacity and alarms are non-testable requirements. It is the responsibility of the respective base/post/camp/station communication agency to provide this with the SUT when installed.
2 Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.

Table 2. DVX Requirements (continued)

LEGEND:

2W	2-Wire	E1	European Basic Multiplex Rate (2.048 Mbps)	PCM	Pulse Code Modulation
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	EKTS	Electronic Key Telephone System	PCM-24	Pulse Code Modulation - 24 Channels
ANSI	American National Standards Institute	FTR	Federal Telecommunications Recommendation	PCM-30	Pulse Code Modulation - 30 Channels
App	Appendix	FTR 1080B-2002	Video Teleconferencing Services	PIPT	Proprietary Internet Protocol Trunk
BER	Bit Error Ratio	G.711	Standard for PCM of Voice Frequencies	PRI	Primary Rate Interface
BRI	Basic Rate Interface	GR	Generic Requirement (Telcordia)	PSTN	Public Switched Telephone Network
C	Conditional	GR-815	Generic Requirements For Network Element/Network System (NE/NS) Security	Q.735.3	SS7 Signaling Standard for E1 MLPP
C2	Command and Control	H.320	Standard for Narrowband VTC	Q.955.3	ISDN Signaling Standard for E1 MLPP
CAS	Channel Associated Signaling	IEEE	Institute of Electrical and Electronics Engineers	R	Required
CCS	Common Channel Signaling	IP	Internet Protocol	SS7	Signaling System 7
CJCSI	Chairman of the Joint Chiefs of Staff Instruction	IPv6	Internet Protocol version 6	STE	Secure Terminal Equipment
DIACAP	DoD Information Assurance Certification and Accreditation Process	ISDN	Integrated Services Digital Network	STIGs	Security Technical Implementation Guides
DISR	DoD IT Standards Registry	IT	Information Technology	STU-III	Secure Telephone Unit – 3rd Generation
DoD	Department of Defense	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	S/T	ISDN BRI 4-wire interface
DoDI	Department of Defense Instruction	kbps	kilobits per second	T1	Digital Transmission Link Level 1 (1.544 Mbps)
DP	Dial Pulse	Mbps	Megabits per second	T.4	Standardization of Group 3 facsimile terminals for document transmission
DN	Directory Number	MFR1	Multi-Frequency Recommendation 1	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
DS0	Digital Signal Level 0 (64 kbps)	min	minute	TIA	Telecommunications Industry Association
DS1	Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	MLPP	Multi-Level Precedence and Preemption	TDM	Time Division Multiplexing
DSN	Defense Switched Network	MOS	Mean Opinion Score	UCR	Unified Capabilities Requirements
DTMF	Dual Tone Multi-Frequency	NI 1/2	National ISDN Standard 1 or 2	UPS	Uninterruptible Power Supply
DVX	Deployable Voice Exchange	NX56	Data format restricted to multiples of 56 kbps	VBD	Variable bit data
E&M	Ear and Mouth	NX64	Data format restricted to multiples of 64 kbps	VoIP	Voice over Internet Protocol
		para	paragraph	VTC	Video Teleconferencing
		PBX	Private Branch Exchange	yr	year

Table 3. SUT DVX/PBX 1 Requirement Differences and Interoperability Status

UCR Paragraph	Requirement (See note 1.)	DVX Critical	PBX 1 Critical	Status	Remarks
2.3.1	PBX Line	No	Yes	Certified	Met all critical CRs and FRs.
5.3.3.1.1	Normal Wink Start Operations	Yes	No	Certified	Met all critical CRs and FRs.
5.3.3.1.2	Glare Operation	Yes	No	Certified	Met all critical CRs and FRs.
5.3.3.2.1	Abnormal Wink Start	Yes	No	Certified	Met all critical CRs and FRs.
5.3.3.2.2	Glare Resolution	Yes	No	Certified	Met all critical CRs and FRs.
5.3.7	Satellite Timing	Yes	No	Certified	Met all critical CRs and FRs.
5.3.8	Disconnect Control	Yes	No	Certified	Met all critical CRs and FRs.
5.3.9	Reselect and Retrial	Yes	No	Certified	Met all critical CRs and FRs.
5.3.10	Off-Hook Supervision Transition	Yes	No	Certified	Met all critical CRs and FRs.
5.4.1	Dial Pulse Signals	Yes	No	Certified	Met all critical CRs and FRs.
5.4.2	DTMF Signaling	Yes	No	Certified	Met all critical CRs and FRs.
5.4.3	MFR1 2/6 Signaling	Yes	No	Certified	Met all critical CRs and FRs.

Table 3. SUT DVX/PBX 1 Requirement Differences and Interoperability Status (continued)

UCR Paragraph	Requirement (See note 1.)	DVX Critical	PBX 1 Critical	Status	Remarks
7.2	PCM-30 Digital Trunk Interface (Europe only)	Yes	No	Certified	Met all critical CRs and FRs.
2.5.4.2	Manual Test of Trunks	Yes	No	Certified	Met all critical CRs and FRs.
2.5.5	Trunk Group-Remove from Service	Yes	No	Certified	Met all critical CRs and FRs.
2.5.6	Trunk Group-Restore to Service	Yes	No	Certified	Met all critical CRs and FRs.
2.5.7	Carrier Group Alarm	Yes	No	Certified	Met all critical CRs and FRs.
2.5.4.1.1	Basic Line Test Capabilities	No	Yes	Certified	Met all critical CRs and FRs.
2.1.4	Code restriction and diversion	Yes	No	Certified	Met all critical CRs and FRs.
2.4.1.1	Basic Emergency Service (911) Caller	No	Yes	Certified	Met all critical CRs and FRs.
2.4.1.2	Emergency Service (911) Public Safety Answering Point	No	Yes	Certified	Met all critical CRs and FRs.
2.4.2	Trace of terminating calls	Yes	No	Certified	Met all critical CRs and FRs.
2.4.3	Outgoing call trace	Yes	No	Certified	Met all critical CRs and FRs.
2.4.4	Tandem call trace	Yes	No	Certified	Met all critical CRs and FRs.
2.4.5	Trace of a call in progress	Yes	No	Certified	Met all critical CRs and FRs.
A2.3.3	Preset Conferencing	Yes	No	Certified	Met all critical CRs and FRs.
A2.3.3	Conference Notification Recorded Announcement	Yes	No	Certified	Met all critical CRs and FRs.
A2.3.3	Automatic Retrial and Alternate Address	Yes	No	Certified	Met all critical CRs and FRs.
A2.3.3	Bridge Release	Yes	No	Certified	Met all critical CRs and FRs.
A2.3.3	Lost Connection to Conferee or Originator	Yes	No	Certified	Met all critical CRs and FRs.
A2.3.3	Secondary Conferencing	Yes	No	Certified	Met all critical CRs and FRs.
2.6.2	Meet-Me Conferencing	No	Yes	Certified	Met all critical CRs and FRs.
2.12	DSN Hotline Services	Yes	No	Certified	Met all critical CRs and FRs.
3.1.2	Precedence Levels	Yes	No	Certified	Met all critical CRs and FRs.
3.1.3	Announcements	Yes	No	Certified	Met all critical CRs and FRs.
3.1.4	Invocation and Operation	Yes	No	Certified	Met all critical CRs and FRs.
3.2.3	MLPP Trunk Selection	Yes	No	Certified	Met all critical CRs and FRs.
3.2.3.1	Hunt Sequence for Trunks	Yes	No	Certified	Met all critical CRs and FRs.
3.2.3.1.1	ROUTINE Precedence Calls	Yes	No	Certified	Met all critical CRs and FRs.
3.2.3.1.2	Precedence Calls Above ROUTINE Precedence	Yes	No	Certified	Met all critical CRs and FRs.
3.2.3.1.2.1	Method 1	Yes	No	Certified	Met all critical CRs and FRs.
3.2.4	MLPP Interworking with Other Networks	Yes	No	Certified	Met all critical CRs and FRs.
3.4.1	Channel Associated Signaling	Yes	No	Certified	Met all critical CRs and FRs.
3.8.2	Call Forwarding	No	Yes	Certified	Met all critical CRs and FRs.
3.8.3	Call Transfer	No	Yes	Certified	Met all critical CRs and FRs.
3.8.4	Call Hold	No	Yes	Certified	Met all critical CRs and FRs.
3.8.5	Three-Way Calling	No	Yes	Certified	Met all critical CRs and FRs.
3.14	Data Collection	Yes	No	Certified	Met all critical CRs and FRs.
4.2	Primary and Alternate Routing	Yes	No	Certified	Met all critical CRs and FRs.
4.4	DSN Interswitch Trunk Call Processing (non-CCS/ISDN)	Yes	No	Certified	Met all critical CRs and FRs.
4.5.1.9	Emergency Service 911 Conflict Resolution	No	Yes	Certified	Met all critical CRs and FRs.
4.5.2	DSN Switch Outpulsing Digit Formats	Yes	No	Certified	Met all critical CRs and FRs.
4.5.5	Base Services – Abbreviated Numbers	Yes	No	Certified	Met all critical CRs and FRs.
4.5.8	Screening	Yes	No	Certified	Met all critical CRs and FRs.
9	Network Management	Yes	No	Certified	Met all critical CRs and FRs.
12.2	System Availability	No	Yes	Certified	Met all critical CRs and FRs.[2]

Table 3. SUT DVX/PBX 1 Requirement Differences and Interoperability Status (continued)

UCR Paragraph	Requirement (See note 1.)	DVX Critical	PBX 1 Critical	Status	Remarks
12.3	Backup Power	No	Yes	Certified	Met all critical CRs and FRs.[2]
12.3.1	Power Components	No	Yes	Certified	Met all critical CRs and FRs.[2]
12.3.2	UPS Requirements	No	Yes	Certified	Met all critical CRs and FRs.[2]
12.3.2.2	UPS PBX 1 Load Capacity	No	Yes	Certified	Met all critical CRs and FRs.[2]
12.3.3	Backup Power (Environmental)	No	Yes	Certified	Met all critical CRs and FRs.[2]
12.3.4	Alarms	No	Yes	Certified	Met all critical CRs and FRs.[2]
App. 3, para. A3.2.10	VoIP System Downtime (IP network 80 min/yr Subscriber 20 min/yr)	No	Yes	Certified	Met all critical CRs and FRs.

NOTES:
1 The requirements for DVXs and PBX 1s are identical except for those listed in above.
2 Backup power, power components, UPS requirements, UPS load capacity and alarms are non-testable requirements. It is the responsibility of the respective base/post/camp/station communication agency to provide this with the SUT when installed.

LEGEND:

A	Appendix	min	minute
BRI	Basic Rate Interface	MLPP	Multi-Level Precedence and Preemption
CCS	Common Channel Signaling	PBX	Private Branch Exchange
CRs	Capability Requirements	PBX 1	Private Branch Exchange 1
DSN	Defense Switched Network	PCM-30	Pulse Code Modulation - 30 Channels
DTMF	Dual Tone Multi-Frequency	S/T	Four-wire ISDN BRI interface
DVX	Deployable Voice Exchange	SUT	System Under Test
FRs	Feature Requirements	UCR	Unified Capabilities Requirements
IP	Internet Protocol	UPS	Uninterruptible Power Supply
ISDN	Integrated Services Digital Network	VoIP	Voice over Internet Protocol
MFR1	Multi-Frequency Recommendation 1	yr	year

5. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at https://stp.fhu.disa.mil. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at https://jit.fhu.disa.mil (NIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at http://jitc.fhu.disa.mil/tssi. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.

JITC Memo, JTE, Extension of the Special Interoperability Test Certification of REDCOM Slice 2100 with Software Release 3.0A Revision 3, with Specified Patch Group 0 (3.0A R3P0)

6. The JITC point of contact is Ms. Anita Mananquil, DSN 879-5164, commercial (520) 538-5164, FAX DSN 879-4347, or e-mail to anita.mananquil@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 0807204.

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U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities Division, J68
Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

(c) Joint Interoperability Test Command, Memo, JTE, "Special Interoperability Test Certification of REDCOM Slice 2100 with Software Release 3.0A Revision 3, with Specified Patch Group 0 (3.0A R3P0)," 4 February 2009
(d) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of REDCOM Slice 2100 with Software Release 3.0A Revision 3, with Specified Patch Group 0 (3.0A R3P0) (Tracking Number 0807204)," 13 January 2009
(e) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01C, "Policy for Department of Defense Voice Services with Real Time Services (RTS)," 9 November 2007
(f) Defense Information Systems Agency, "Department of Defense Networks Unified Capabilities Requirements," 21 December 2007
(g) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006